

STUDIES IN SOUTH AFRICAN RICCIACEAE.

III. A NEW SPECIES OF OXYMITRA.

by

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Dr. T. R. Sim (1926) in "The Bryophyta of South Africa" did not record any species of *Oxymitra* from South Africa, and it was almost ten years after the publication of his work that Dr. A. V. Duthie (then working on the South African Ricciaceae) identified as *Oxymitra*, the first specimens of this genus to be discovered in this region.

These were collected by Miss D. M. Gemmell and Dr. Lutjeharms near Bloemfontein in June 1938 and Dr. Duthie made some notes and drawings from this material but for various reasons was unable to complete the work and the specimens were passed on to the present writer for further study.

Recently, as recorded below, Dr. E. Schelpe has again collected the same species in a very favourable condition of development, so that additional drawings could be made from living material. All drawings, photographs and specimens are in the Bolus Herbarium.

***Oxymitra cristata* Garside, sp. nov.**

Monoica. Frondes caespitosae confertae, intense virides, integrae vel furcatae, apice rotundatae: squamae ventrales biseriatae, atro-violaceae vel basin versus gradatim hyalinae. oblique triangulares, magnae, denseque imbricatae, apice longe cuspidatae, margine frondis bene superantes, in apice frondis hamatim incurvae.

Stomata simplicia a 5—4—6 cellulis parietibus radiantibus parum incrassatis cincta.

Antheridia in pulvillos medianos lineares, ostiolis longe eminentibus basi minute bracteatis atque cum aetate purpurascentibus.

Archegonia, ante antheridia posita, in serie unica lineari disposita atque in involucri connata immersa, cristam medianam prominentia crenatam formantia. Bractae desunt.

Sporae angulares nigrescentes, 100—115 μ in maximo diametro: ala angusta usque ad 5 μ lata, margine integra vel crenata: exterior facies irregulariter reticulata, interiores facies laeves.

Type in Herb. Bolus, Schelpe 5900, Duthie 5531.

Duthie, 5460, Eagles Nest, Bloemfontein, O.F.S. Leg. Miss Gemmell and Dr. Lutjeharms, "On ironstone kopje, in shelter of grass and boulders". June 1938.

Duthie 5501. Near Hillandale, Bloemfontein, O.F.S. Leg. Miss Gemmell, April, 1939.

Duthie 5531. Groenwater Valley, E. Postmasberg, Hay, Griqualand West, Cape Province. Leg. O. L. Cooke, April 1942.

Schelpe 5900. Near Bredby Mine (25 miles S. of Kuruman) Cape (Central) Province. 4,800 ft. "Locally common in moist crevices of ironstone cliffs". April 1956.

There are only two previously described species of this genus.

They are *O. paleacea* Bisch. from the Mediterranean region, North Africa and Brazil, and *O. androgyna* Howe, from North America (Texas). The first is dioecious and the female plant has each archegonium surrounded by its own pyramidal involucre, the numerous involucres being arranged in two rows along the median line and accompanied by numerous bracts; the second species is monoecious, the archegonia have similar involucres but these are mixed with antheridia and bracts.

K. Müller (1952) has placed the latter species as a synonym of *O. paleacea*, because K. Györfy (1926) has maintained that *O. androgyna* (which also occurs in many parts of Europe) is only a monoecious form of *O. paleacea*. The latter species is therefore widely spread in the northern hemisphere and South America.

The new species from South Africa differs in a remarkable way from both the above, in having, when the thallus is mature, the archegonia in a single row in the median line covered by a continuous mass of tissue which may be regarded as being composed of the fused involucres of the archegonia, the entire group of archegonia thus being hidden in a crest-like elevated ridge, the length of this crest depending upon the number of archegonia produced. (Fig. 1 A).

Immediately behind this crest, the ostioles of the antheridia project from a median pulvinus (A), and they lead to the cavities in the thallus in which the antheridia are embedded (C).

Compared with *O. paleacea* and *O. androgyna*, there is a notable absence of bracts in the vicinity of the sexual organs, the only traces of these being the very short scales composed of a few cells each, which are to be found at the bases of the ostioles (C.).

These bracts, as well as the ostioles become deep purple with age. The colour of the general surface of the thallus is a dark green, and when the plant is fresh this contrasts strikingly with the purple-black colour of the ventral scales (D) which curve over the thallus apex and often over the thallus margins.

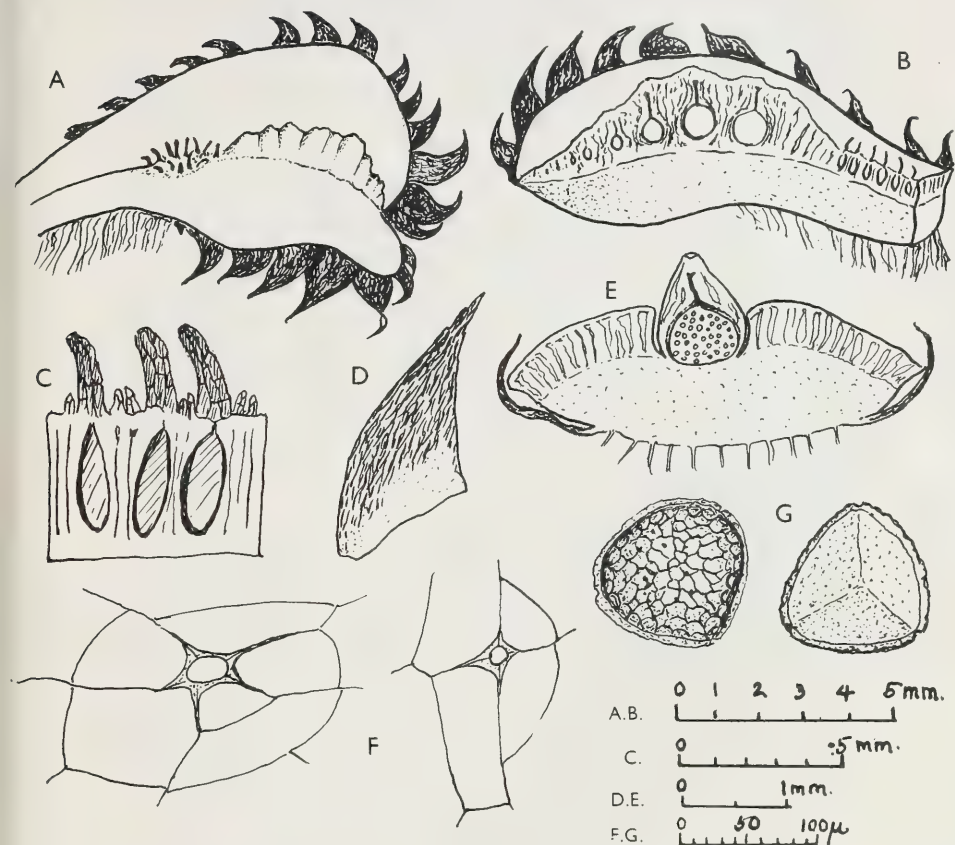


FIG. 1. *Oxymitra cristata* Garside.

- A. Thallus with antheridia and archegonia.
- B. Section of thallus along the median line.
- C. Section of antheridial group showing ostioles and bracts.
- D. Ventral scale.
- E. Transverse section of thallus through the archegonial region.
- F. Two air-pores.
- G. Spores; left, the outer face; right, the inner faces. (A to F drawn from Schelpe No. 5900; G from Duthie No. 5531.)

The air-pores of the upper epidermis are usually surrounded, each by 4 cells, 5 or 6 cells being rarely found. The radial walls of these cells are slightly thickened in the region of the pore itself, giving it a stellate appearance (F).

The archegonia are in a single line, each in a flask-shaped cavity which opens on the ridge of the archegonial crest. They have long necks which become deep purple with age (B and E).

The spores are black, opaque, and somewhat angular, with smooth inner faces separated by a slight tri-radiate marking (G, right).

The exterior (convex) face (G, left) has an irregular reticulum of about 10 areolae across the diameter, the areolae tending to elongate towards the periphery and having irregularly thickened walls. The reticulum is often incomplete in smaller spores and papillae are not developed. The narrow margin or wing of the spore may have its outer edge entire or slightly crenate. Germination of the spore has not been observed.

The thallus when dry becomes incurved, exposing only the large purple scales of the ventral surface, and the plant seems capable of undergoing long periods of drought in this state, and recovering again when moistened. All the specimens examined had been growing on red-brown clay soils, evidently containing much iron.

The detailed geographical distribution is not yet completely known. The few localities from which the plant has been obtained are very centrally situated in South Africa, all are at moderate altitudes (3,500—4,500 ft.), and have an average yearly rainfall of 15—25 in. of which 76—85 per cent. occurs during the summer months. Thus the growing season of the plant is probably from December to April, spores being mature in the latter month.

It appears that there is still some doubt if the name *Oxymitra* Bisch. (1889) is to remain valid, as opposed to *Oxymitra* (Blume) Hook. et Thomas (1855) for a genus of Anonaceae which was originally published by Blume in 1828 as a section of *Polyalthia*.

The generic name *Pycnoscenus* Lindb. (1863) is available if *Oxymitra* is not conserved for a liverwort genus (Little, 1949), in which case *Oxymitra cristata* Garside becomes *Pycnoscenus cristatus* (Garside) Garside.

The distinctive crest-like archegonial involucre of *O. cristata* will necessitate some modification of the generic characters usually given for *Oxymitra*. All previous authors have stressed the condition of having a conical or pyramidal involucre with air-chambers and air-pores around each archegonium. Thus Stephani (1898) (under the synonym *Rupinia* Corda) says:—"Archegonia seriata, singula involucro spongioso, conico-cylindrico, apice aperto circumvallata".

Indeed, when K. Müller (1940) made a new family, Oxymitraceae,

for this single genus, he still retained this feature as a family character.

O. cristata has neither separate involucre nor scales at the base of the crest-like female involucre, so that in future these characters will have to be regarded only as specific characters, because in all other respects *O. cristata* is a typical *Oxymitra*, and there can be no question of making it the type of a new genus.

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